

A NEW SPECIES OF *MABUYA* (SQUAMATA: SCINCIDAE) FROM THE SEMIARID CAATINGAS OF NORTHEASTERN BRAZIL

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ABSTRACT

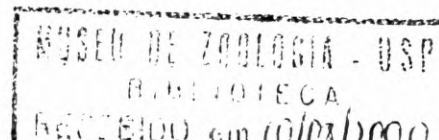
A new species of Mabuya with a prominent snout, paired frontoparietals, four supraoculars, and an alternating pattern of black and light dorsolateral and lateral stripes terminating abruptly posterior to the forelimb insertion, is described from the semiarid Brazilian Caatingas. Mabuya agmosticha, sp. nov., also differs from sympatric M. macrorhyncha in usually having the fifth supralabial below the eye (the sixth in M. macrorhyncha) and by the length of the second loreal scale (longer in M. macrorhyncha). The habitat of the new species is clumps of thorny, succulent bromeliads.

KEYWORDS: Squamata; Scincidae; *Mabuya agmosticha*; New species; Taxonomy; Brazil

The South American lygosomine skinks of the genus *Mabuya* are still poorly known. Dunn (1935) was the first to undertake a general revision of the American taxa and established the presently accepted systematic arrangement. For continental South America the species he recognized were: *M. dorsivittata* from southern Brazil, Paraguay and Argentina; *M. guaporicola* from the headwaters of Rio Guaporé, Mato Grosso, Brazil; *M. frenata* (two subspecies) from Bolivia, Paraguay, Argentina and South to Central Brazil; *M. nigropalmata* from Amazonian Bolivia and Brazil; and *M. mabouya*. He admitted two

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subspecies for *M. mabouya*, the nominal one encompassing an enormous range from Mexico to southern South America, and *M.m. sloanii*, restricted to the Caribbean, from Saint Vincent to the Bahamas. He also described *M. deserticola* from the coast of Peru (Mollendo). This last form was placed in the synonymy of *M. mabouya* by Peters and Donoso-Barros (1970), who otherwise used Dunn's scheme. In the catalogue of Neotropical Squamata (Peters and Donoso-Barros, 1970) only two new species, described since then, were included: *M. macrorhyncha* (Hoge, 1946) from Ilha da Queimada Grande, on the continental shelf of the State of São Paulo, Brazil, and *M. heathi* (Schmidt and Inger, 1951), from Fortaleza in northeastern Brazil.

Horton (1973) described *Mabuya croizati* a distinctive species from Mount Turumiquire, Estado Sucre, Venezuela. Rebouças-Spieker (1974) studied the species from the coast of the State of São Paulo, Brazil, which keyed out as *Mabuya mabouya* under Dunn's (1935) scheme. Rebouças-Spieker recognized three species in this region: *M. agilis* Raddi, type locality Rio de Janeiro, considered previously a synonym of *M. mabouya* (Dunn, 1935; Peters and Donoso-Barros, 1970), *M. macrorhyncha* Hoge, 1946, and *M. caissara*, proposed in that paper as a new species from the northern coast of the State of São Paulo. Later, she described *Mabuya arajara* from the State of Ceará (Rebouças-Spieker, 1981a). She also suggested that the name *Scincus bistriatus*, (Spix, 1825), should be used for the common Amazonian form currently identified as *M. mabouya*. Although the types were no longer in existence and she did not designate the figure of *Scincus bistriatus* as a lectotype, this was a good step to stabilize nomenclature. Actually, this species could be associated with the specimen figured by Spix and with the data published by Peters (1877), who examined the types. In the same year she described *M. ficta*, another Amazonian species broadly sympatric with *M. bistriata* (Rebouças-Spieker, 1981b).

The last species described in South America was *Mabuya carvalhoi* (Rebouças-Spieker and Vanzolini, 1990). This is a distinctive species having fused prefrontal scales that appears to be related to *M. croizati*. *Mabuya carvalhoi* is still rare in collections and is known only from the type locality (Ávila-Pires, 1995), Ilha de Maracá in the State of Roraima, Brazil.

Recently, Ávila-Pires (1995) examined the lectotype of *Scincus bistriatus* (Spix, 1825), designated by Hoogmoed and Gruber (1983). She identified the specimen as *M. ficta* and placed the latter in the synonymy of *Mabuya bistriata*. Consequently, she proposed that the name *Scincus bistriatus* should be applied to the species of Amazonian *Mabuya* currently identified as *M. ficta*. Additionally, despite disagreement between the Amazonian specimens of *Mabuya* and the figure depicted as *Scincus nigropunctatus*, (Spix, 1825), she designated a neotype for *M. nigropunctata*, linking the name to the species

referred in the literature after 1981 as *Mabuya bistriata*. The specimen figured by Spix, as noted by Vanzolini (1981) cannot be confidently identified with any Brazilian *Mabuya*. Peters (1877) examined the types and his data confirm that the specimen is a *Mabuya* with three supraoculars, not four as in most Amazonian *Mabuya*. The argument of Ávila-Pires (1995) suggesting that the type was an aberrant specimen having only three supraoculars, for which she found evidence in one specimen among more than 100 examined, is arguable. Considering that neither the lectotype of *Scincus bistriatus* designated by Hoogmoed and Gruber (1983) corresponds to the figure of *Scincus bistriatus* (as admitted by themselves) nor the neotype of *Scincus nigropunctatus* fits Spix's figure, I cannot accept uncritically these propositions. Following the current usage in the recent herpetological literature, I use the names *M. bistriata* and *M. ficta* (*sensu* Rebouças-Spieker, 1981a,b) for these two Amazonian species. A broad revision of the American forms of *Mabuya* is needed to resolve the chaotic nomenclature of this complex.

Brazilian *Mabuya* with a prominent snout, four supraoculars, paired frontoparietals, and two distinctive dorsolateral light stripes, occurring along the Atlantic coast from the State of São Paulo to the State of Rio Grande do Norte, have since the original description been recognized as *Mabuya macrorhyncha* (Duarte *et al.*, 1995; Freire, 1988; Hoge, 1950; Mertens, 1955; Müller, 1969; Rebouças-Spieker, 1974; Vanzolini and Rebouças-Spieker, 1976). Years ago I collected at Cabaceiras, State of Paraíba, in the semiarid northeast of Brazil, several specimens similar to *M. macrorhyncha*. The most striking difference was the interruption of the body stripes just behind the arm. Although I recognized this form as a new species, it was temporarily attributed to *Mabuya macrorhyncha* (Rodrigues, 1986). The reproductive biology of the same population (referred as *Mabuya* sp.) was also studied during 17 consecutive months (Stevaux, 1993). The absence of other South American populations of *Mabuya* with a similar color pattern, and the absence of other reliable differences between *M. macrorhyncha* and that form led me to defer its description.

Recently, I had the opportunity to examine another series of this species from Xingó, State of Alagoas, where it occurs sympatrically with *Mabuya macrorhyncha*. As they differ sharply in color pattern and in other characters, herein I formally describe it as a new species.

MATERIALS AND METHODS

The type series was collected during the filling of the hydroelectric dam of Xingó in the lower Rio São Francisco, at the border between the states of

Sergipe and Alagoas. The material is deposited at the herpetological collection of the Museu de Zoologia da Universidade de São Paulo (MZUSP). All comparative data were obtained from preserved specimens at MZUSP (Appendix I). Snout-vent length and tail length were measured to the nearest 1 mm with a ruler. Scale nomenclature and scale counts, follow Rebouças-Spieker (1974). The only exception were the ventral scales which were counted from the anterior level of fore limb to the vent.

Species Description

***Mabuya agmosticha* sp. nov.**

Holotype. MZUSP 79189, an adult male from Xingó: (09°24'S, 37°58'W; approximately 450 m elevation); State of Alagoas: Brazil collected by Nelson Jorge da Silva Jr. on 10 May 1994 at the northern margin of the dam.

Paratypes. MZUSP 78947-78949, MZUSP 79164, MZUSP 79167-79170, MZUSP 79172-79188, 79190-79197. Same data of the holotype, collected between 10 May and 11 June 1994.

Other specimens examined. MZUSP 59177, 59178, 60764-60771, 60855-60858, from Cabaceiras (Fazenda Bravo): state of Paraíba: Brazil.

Diagnosis. A *Mabuya* with an undivided lower eyelid, all scales smooth, auricular lobes absent, smooth scales on the soles, and having: 1) a prominent snout; 2) a pair of frontoparietals; 3) four supraoculars; 4) a pair of dorsolateral and lateral light stripes alternating with dark stripes which extend from the head to only just after the arm.

Among the continental South American *Mabuya* only three species are characterized by a prominent snout: *M. macrorhyncha*, *M. croizati*, and *M. carvalhoi*. I restrict comparisons of the new species to these species. However, *Mabuya agmosticha* is the only South American species with a pattern of alternating dorsolateral and lateral light and dark stripes that abruptly terminate after the arm.

Mabuya agmosthica differs from *M. croizati* and *M. carvalhoi* by having (data for the latter species in parenthesis): two frontoparietal scales (single); usually one pair of nuchals (more than two); body stripes extending only to just after the arm insertion (to the tail). *Mabuya agmosticha* and *M. croizati* also

differ from *M. carvalhoi* by having paired prefrontal scales; (fused in *M. carvalhoi*). From *Mabuya macrorhyncha*, *M. agmosticha* differs by the interruption of the body stripes (extending to the tail), by having the fifth supralabial under the eye (generally the sixth), and a first loreal extending to the level of the half of the second supralabial (overlapping the 3th).

Description of the holotype. (Fig. 1). Rostral broad (Fig. 2), wider than high, contacting first supralabial, nasal, supranasals, and frontonasal; its posterior border slightly convex. Supranasals much longer than wide, on top of and as long as nasal, separated above rostral by frontonasal and contacting anteriormost loreal. Frontonasal large, pentagonal, as long as wide, contacting anterior loreal. Prefrontals separated at midline by contact between frontal and frontonasal, wider than long, contacting anterior and posterior loreals, first superciliar, and first supraocular. Frontal elongate, approximately twice as long as wide, wider anteriorly, in contact with frontonasal, prefrontals, first and second supraoculars, and frontoparietals. Frontoparietals longer than wide, in broad contact at midline, indented posteriorly by a interparietal. Interparietal longer than wide, wider anteriorly and revealing a minute but distinctive parietal eye posteriorly. Parietals larger than interparietal, wider than long, in contact behind interparietal. Nuchals imbricate, wider than long. Supraoculars four; first the smallest, second the longest and widest. Superciliaries five, subequal. Nasal longer than wide, between supranasal and first supralabial, with a latero-superiorly oriented oval nostril pierced in the posterior third and occupying almost the width of scale. Two loreals behind nasal; anteriormost slightly longer than wide, contacting supranasal and first supralabial, extending posteriorly to level of second supralabial. Posterior loreal irregular, dorsal margin much larger than ventral margin. Two frenoculars behind posterior loreal. Supralabials eight; sixth the highest, fifth the largest and below eye. A series of small postoculars, smaller than temporals, between 6th supralabial and 5th superciliary. Temporals smooth, imbricate, rhomboid, very similar to lateral scales of trunk. Lower eyelid undivided, with a transparent disk. Twelve palpebrals on the upper eyelid. Ear opening small, round, bordered by cycloid, smooth, and imbricate scales, the upper ones largest.

Mental wider than long, posterior margin straight. Postmental shorter, slightly asymmetric. Postmental and two pairs of chin shields in contact with infralabials. First pair of chin shields in contact medially, second pair separated by a smaller cycloid scale. Gulars cycloid, smooth, imbricate, similar to ventrals. Infralabials eight, 5th, 6th, and 7th subequal and the largest ones, first smallest. All head scales smooth, slightly imbricate.

Dorsal, lateral, and ventral scales of body and tail smooth, cycloid,

imbricate, in longitudinal and oblique rows. Fifty-five transverse rows of dorsal scales between interparietal and posterior level of hind limbs. Scales around midbody 30. Thirty eight transverse rows of ventrals from the anterior level of forelimb to preanals. Preanals similar to ventral scales.

Limb scales smooth, imbricate, cycloid, smaller but similar to body and tail scales, except on palmar and plantar surfaces, which are covered by large juxtaposed granules. Subdigital lamellae single, distinctly larger than granules of palm and sole. Most subdigital lamellae callose, juxtaposed, except for distal ones which are thinner and imbricate; 12 subdigital lamellae on finger IV and 16 on toe IV. Fingers and toes clawed, length in the following order: I > II = V > III = IV.

Dorsal and lateral surfaces of body and tail olivaceous green in life. A very conspicuous dorsolateral light stripe, approximately one scale wide from last supraocular to just posterior to the arm. Below it a longitudinal lateral dark stripe, two scales wide, beginning at nasal scale, becoming very distinctive posterior to eye and, after running along upper margin of ear, terminating posterior to forelimb. Dorsolateral light stripe bordered above by a black stripe one-half scale wide. An inconspicuous white stripe borders lateral black stripe ventrally, beginning at the lower part of the first infralabial, passes across ear and disappearing just after forelimb insertion. Below white stripe a series of irregular and longitudinally arranged black punctuations. Dorsal and lateral parts of body behind the arm and dorsal and lateral parts of tail olivaceous green with irregular scattered fine dark punctuation. Ventral parts of body, tail, and limbs, cream-colored. Dorsal and lateral surfaces of limbs olivaceous green. In juveniles the posterior half of tail is a bright blue.

Snout-vent length 71 mm; tail regenerated.

Etymology. The specific name is an adjective referring to the abrupt termination of the body stripes in this species.

Variation and Comparison with M. macrorhyncha. Table 1 summarizes variation in scalation for the type series of *Mabuya agmosticha*, and compares the data with those for sympatric *M. macrorhyncha*. Both are very similar in scalation and there are no diagnostic differences in number of dorsal and ventral scales, scales around midbody, infradigital lamellae on finger IV and toe IV, and number of infralabials and palpebrals. Besides color pattern, the number of supralabials and the length of the first loreal clearly separates these two sympatric species. The number of supralabials in *M. agmosticha* is generally eight and the fifth is generally under the eye. Only 5 individuals (of a total of 31 checked), have 9 supralabials; in four individuals the character is symmetric and in one (MZUSP

79179) there are 9 supralabials on the left side and 8 on the right. In all specimens with an additional supralabial the one below the eye is the sixth. In all specimens of *M. macrorhyncha*, there are nine supralabials, the sixth always under the eye. The length of the first loreal further distinguishes the two forms in sympatry. In *M. agmosticha* the first loreal reaches the middle of the second supralabial; in *M. macrorhyncha* it extends further, reaching the middle of the third supralabial. In the five specimens of *M. agmosticha* with 8 supralabials (sixth under the eye), the loreal condition unambiguously separates the two species. One specimen of *Mabuya agmosticha* (MZUSP 79181) has the anterior and posterior loreals fused but typically has 8 supralabials, the 5th under the eye.

The differences in color pattern are so striking that they immediately separate the two species. In *Mabuya agmosticha* the dorsolateral and lateral stripes of the body terminate abruptly behind the arm. In *Mabuya macrorhyncha* these stripes are continuous, extending to the tail. The dorsolateral light stripe of *M. macrorhyncha* extends from the fourth supraocular to the first third of the tail; the dark stripe that borders it above, also reaches the tail and is more conspicuous than the broken stripe of *M. agmosticha*. The lateral dark stripe that borders the light stripe ventrally is wider in *M. macrorhyncha* (two to two and half scales, against two in *M. agmosticha*), covers the upper half of the ear (just runs along it in *M. agmosticha*), and reaches the tail, where it gradually vanishes posteriorly. In *M. macrorhyncha* the lateral light stripe bordering the lateral dark stripe begins at the supralabials, crosses the lower half of the ear, and, as in *M. agmosticha*, disappears behind the insertion of the arm. The irregular longitudinal punctuations bordering ventrally the lateral light stripe of *M. agmosticha* is absent in sympatric *M. macrorhyncha*. The ventral pattern is identical in both species. Snout-vent length in the type series of *M. agmosticha* (n = 37) varied from 38 to 72 mm, and from 42 to 65 mm (n = 7) in sympatric *M. macrorhyncha*.

Although there is only one type of color pattern present in the specimens from Cabaceiras, State of Paraíba, in full agreement with the one described for *M. agmosticha*, the other two characters are not so diagnostic. Most of these specimens have 8 labials (the 6th under the eye), and the anterior loreal also shows the condition described for the specimens of *M. macrorhyncha* from Xingó. Due to the strong and clear differences between *M. agmosticha* and *M. macrorhyncha* in sympatry, I attribute these specimens to *M. agmosticha*, but this geographic variation prevents the inclusion of specimens as paratypes.

Seven other specimens previously identified as *M. macrorhyncha* at the MZUSP collection (MZUSP 55504-55505, MZUSP 56375-56376, from Sopa; MZUSP 56367-56369, from Extração, both in the State of Minas Gerais) also have stripes abruptly interrupted at midbody. Although possibly related to the

new species here described, the salt and pepper-like pattern they present in the rear part of the body suggests that they may represent another undescribed *Mabuya*. Both localities are in the Serra do Espinhaço, which extends from Minas Gerais to Bahia. An interesting parallel to note is that region (900 to 2000 m of altitude) is characterized by the endemic plant family Velloziaceae, which has relictual species in the Caatingas.

There is almost no variation in the color pattern of *Mabuya macrorhyncha* in the enormous area comprising more than 1,200 km along the coast, from the south of the State of São Paulo to Natal, in the State of Rio Grande do Norte. The stripes vary in distinctiveness, but are invariably present and extend to the tail. As already described by other authors (Rebouças-Spieker, 1974; Hoge, 1946, 1950) the number of supralabials of *M. macrorhyncha* varies between eight and nine, and the sixth is usually under the eye.

Distribution and ecology. As presently known, *Mabuya agmosticha* occurs only at two localities, both in the semiarid caatingas of northeastern Brazil (Figure 3). At Xingó, in the border between the States of Alagoas and Sergipe, it is sympatric with *Mabuya macrorhyncha* and *M. heathi*. As far as we know, *M. agmosticha* is the only *Mabuya* occurring at Cabaceiras, State of Paraíba. These two localities are approximately 350 km apart.

There are no precise ecological data for the specimens obtained at Xingó. The type series was collected in the lake during the filling of the hydroelectric dam of Xingó. The region was formerly characterized by a large canyon opened by the Rio São Francisco. Local vegetation was, as typical in semiarid caatingas, open, thorny, deciduous, and characterized by the abundance of Cactaceae. Clumps of “macambira”, a very thorny and succulent bromeliad (*Bromelia laciniosa*) were very common on the cliffs. The specimens of *Mabuya heathi* and *M. macrorhyncha* were collected in the same general area. Specimens of all three species were collected directly in the water or in the remaining vegetation standing above water.

The habitat at Cabaceiras is very similar. The region is characterized by crystalline rocky floor (“lajeiros”) covered by caatinga vegetation. Specimens from Cabaceiras were predominantly found in the interior of large clumps of “macambira” (*Bromelia laciniosa*). Although a few specimens of *M. agmosticha* were collected under the bark of dry Cactaceae, in fallen logs, or directly on the ground, there seemed to be a clear preference for thickets of thorny bromeliads. More information on the habitat and ecology of this population was published previously (Rodrigues, 1986; Stevaux, 1993).

Mabuya macrorhyncha has never been found associated with clumps of *Bromelia laciniosa*. This species is found in open sandy regions, mostly in

restingas (the local name for sandy open habitats near the coast), where it typically inhabits ground bromeliads of the genera *Hohenbergia* and *Achmea*. Some locality records at MZUSP collection attest the presence of this species far inland, including Raso da Catarina, in the State of Bahia.

DISCUSSION

Mabuya is a poorly known genus of skinks occurring in South and Central America (including the Caribbean region), Africa, Asia, and the Pacific and Indian Oceans. About 30 species have been described since Boulenger's (1887) general revision (Nussbaum and Raxworthy, 1994). Some reviews have been made, but they were geographically restricted and generally addressed to solve local taxonomic problems (i.g. Broadley, 1974, 1975, 1977; Brygoo, 1981, 1983; Hoogmoed, 1974; Rebouças-Spieker, 1974). It remains unclear if the species groups originally proposed by Boulenger (1887) are monophyletic. In South and Central America, excepting for *Mabuya maculata* from Fernando de Noronha Island, possibly related to African forms, all species are characterized by the presence of an undivided lower eyelid, by the absence of auricular scales in the anterior margin of the ear, and by smooth infradigital lamellae. Based on similarity and on maximum body size, the 14 species currently recognized in continental South America may be preliminarily separated in the following groups: 1) small species with a prominent or acuminate snout: *M. macrorhyncha*, *M. croizati*, *M. carvalhoi*, and *M. agmosticha*; 2) small species with normal

Table 1. Number of dorsal scales, of scales around body, of ventral scales, of IV finger and IV toe infradigital lamellae, and number of supralabials, infralabials and palpebrals for *Mabuya agmosticha* and *M. macrorhyncha* at Xingó, Alagoas. Numbers are in the following order: sample size, mean, range, and mean deviation of the mean.

Characters	<i>Mabuya agmosticha</i>				<i>Mabuya macrorhyncha</i>			
Dorsals	(31)	52.5	(50-58)	1.74	(7)	52.1	(50-53)	1.06
Midbody	(31)	29.0	(26-31)	1.18	(7)	28.1	(27-30)	0.89
Ventrals	(30)	35.5	(33-38)	1.10	(7)	35.8	(35-37)	0.89
IV Finger	(31)	11.5	(10-13)	0.67	(7)	12.4	(11-13)	0.78
IV Toe	(29)	15.5	(12-17)	1.05	(7)	16.1	(14-17)	1.06
Supralabials	(31)	8.1	(8-9)	0.37	(7)	9	9	0.00
Infralabials	(31)	7.9	(7-8)	0.17	(7)	8	8	0.00
Palpebrals	(31)	10.1	(9-13)	1.10	(7)	11.1	(10-14)	1.46

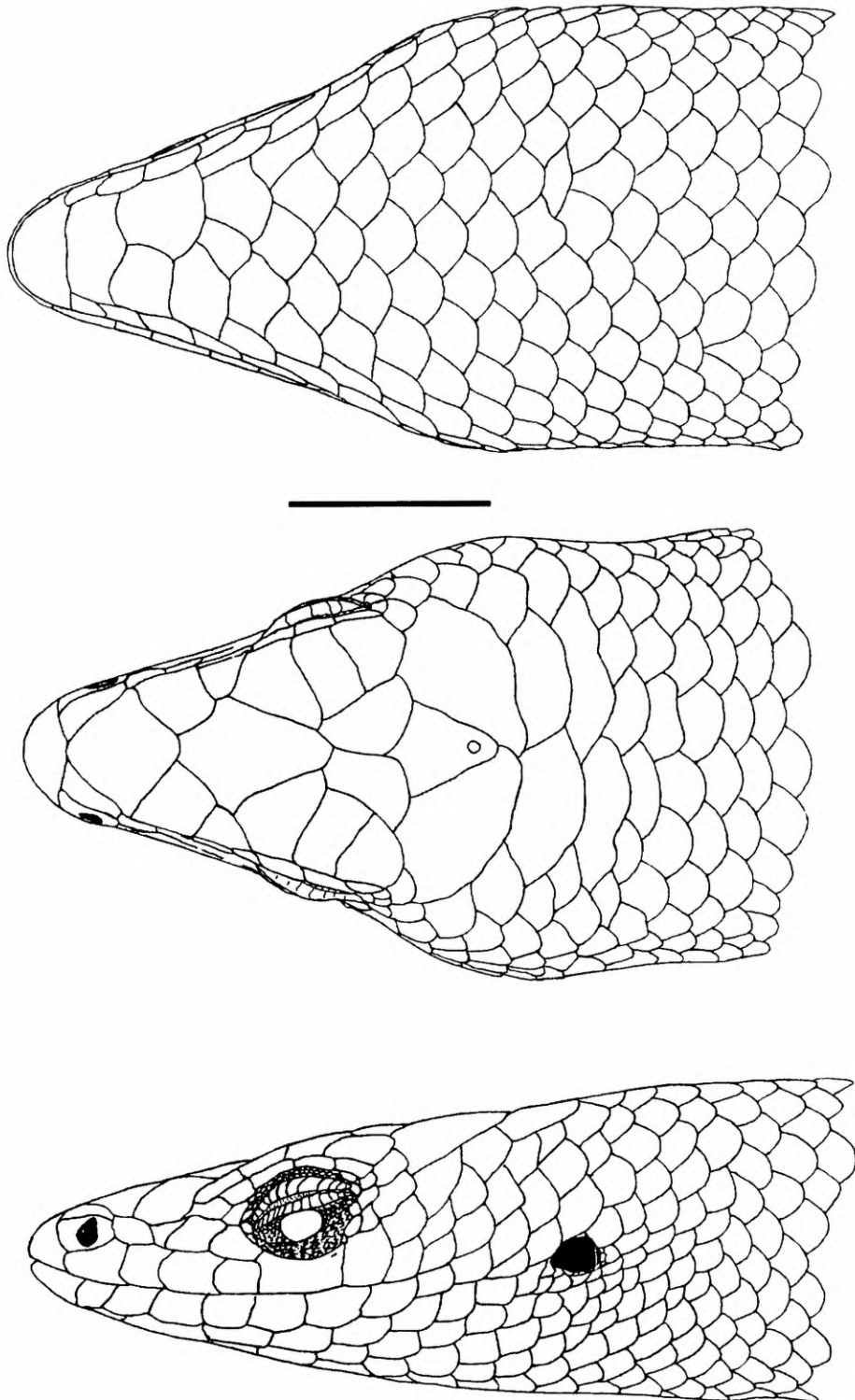


Fig. 1. *Mabuya agmosticha*, dorsal and ventral views of the holotype (MZUSP 79189), from Xingó, Alagoas.



Fig. 2. *Mabuya agmosticha*, holotype (MZUSP 79189). Ventral, dorsal, and lateral views of the head. Scale bar equals 5 mm.

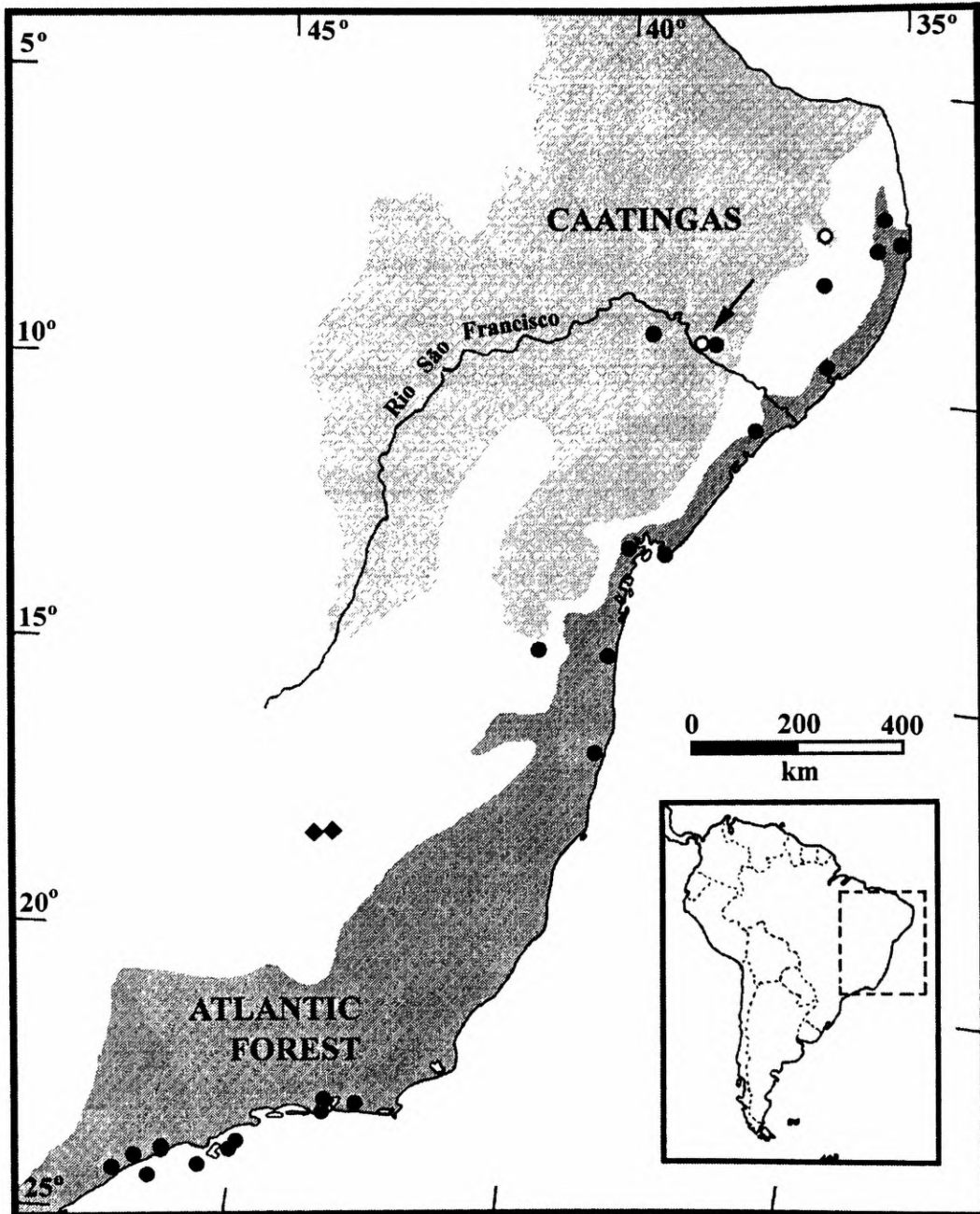


Fig. 3. Localities of *Mabuya agnosticha* (open circles) and *M. macrorhyncha* (closed circles). The lozenges correspond to the still unidentified specimens referred in the text, and the arrow indicates the type locality of *M. agnosticha*



Fig. 4. *Mabuya agmosticha* sp nov.

snout and fused frontoparietals: *M. frenata* and *M. nigropalmata*; 3) small species with normal snout, paired frontoparietals, and vertebral stripes on body: *M. dorsivittata*, *M. heathi*, *M. agilis*, *M. caissara*, and *M. guaporicola*; and 4) large species with normal snout, paired frontoparietals, and no vertebral stripes on body: *M. arajara*, *M. bistrata*, and *M. ficta*. As the systematics of the genus is not easy, specially due to the individual and geographical character variation, I emphasize that these groups are only convenient and based on similarity. I have no doubt that a phylogenetic oriented study will assemble some of them otherwise and give support to other schemes.

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APPENDIX I
Specimens examined*Mabuya agmosticha*

BRAZIL: *Alagoas*. Xingó: MZUSP 78947-78949, 79164, 79167-79170, 79172-79197. *Paraíba*. Cabaceiras (Fazenda Bravo): MZUSP 59177, 59178, 60764-60771, 60855-60858.

Mabuya macrorhyncha

BRAZIL: *Alagoas*: São Miguel dos Campos: MZUSP 3207-3212; Xingó: MZUSP 79159-79163, 79165, 79171. *Bahia*: Ilhéus: MZUSP 81425, 81426; Planalto Baiano: MZUSP 55436; Reserva Biológica de Pau Brasil (CEPLAC) - 15 Km NW Porto Seguro: MZUSP 66164; Raso da Catarina: MZUSP 62754, 66112; São Felipe: MZUSP 36921; Salvador: MZUSP 238. *Paraíba*: Alhandra: MZUSP 21480; Fazenda Pacatuba (10 Km N Sapé): MZUSP 60891-60897. *Pernambuco*: Agua Azul, Vicência: MZUSP 23089; Serra dos Cavalos, 13 Km ESE São Caetano: MZUSP 66052, 66053. *Rio de Janeiro*: Rio de Janeiro: MZUSP 519; Barra de Maricá: MZUSP 63808, 63809, 74912-74915, Barra da Tijuca: MZUSP 54538-54540; Ilha do Fundão: MZUSP 78916. *São Paulo*: Guarujá: MZUSP 25261-25296; Ilha da Queimada Grande: MZUSP 5220-5364; Ilha da Vitória: MZUSP 532; Ilha dos Alcatrazes: MZUSP 377; Ilha dos Búzios: MZUSP 11139-11205; Mongaguá: MZUSP 24050-24073; Peruíbe: MZUSP 23949-24049. *Sergipe*: Santo Amaro das Brotas: MZUSP 49681.